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NRO review completed

6409-69  
TAB A, Section 1

25X1

OX CART

SUMMARY AND PROGRESS

(1 January 1969 - 31 March 1969)

I. GENERAL

A. OXCART

1. AFIGOS (Pentagon) has requested A-12 cost data from Lockheed Aircraft Corporation (LAC) for inclusion in FY-70/ FY-71 NRO budget considerations.

2. The cost data is to reflect three options of costing, as follows:

a. The basic costs for continuing inspection and maintenance of the stored OXCART fleet.

b. The additional costs and timing for bringing one A-12 aircraft to a "ready-fly" condition.

c. The total costs and timing for processing five A-12 aircraft to a "ready-fly" condition.

3. The OXCART [ ] will not be exercised. The connotation of "ready-fly" condition being to demonstrate a high-flight, supersonic capability.

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25X1

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Approved For Release 2002/08/17 : CIA-RDP83-02415A000800020003-7

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25X1

TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP83-02415A000800020003-7

6409-69

25X1

TAB B, Section 1

Page 2

IDEALIST

DEVELOPMENT SUMMARY AND PROGRESS

(1 January 1969 - 31 March 1969)

I. AIRFRAME



B. U-2R FLIGHT TEST AND OPERATIONAL TRAINING  
SUMMARY (THRU 31 MARCH 1969)

	<u>J.F.M. FLTS</u>	<u>J.F.M. TIME</u>	<u>TOTAL FLTS</u>	<u>TOTAL TIME</u>
1 - 051	13	29.4	108	337.6
2 - 052	3	12.5	58	215.0
3 - 053	16	64.7	84	260.3
4 - 054	23	95.5	84	285.1
5 - 055	34	153.8	90	310.4
6 - 056	--	----	21	47.1
7 - 057	36	126.6	71	285.7
8 - 058	27	126.9	65	247.7
9 - 059	--	----	6	11.0
10 - 060	5	16.6	19	33.5
11 - 061	4	8.4	13	25.0
12 - 062	<u>4</u>	<u>13.5</u>	<u>11</u>	<u>25.7</u>
TOTAL	165	647.9	630	2084.1

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AND DECLASSIFICATION

TOP SECRET

TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP83-02415A000800020003-7

6409-69

TAB B, Section 1

Page 3

25X1

## II. PROPULSION

A. Engine Thrust Management - The effort to develop a satisfactory engine pressure ratio (EPR) curve for determining maximum safe power settings for the J75-P-13B engine at altitude has been completed. As a result of an extensive accumulation of flight test and flight experience data at both Detachments [REDACTED] a final EPR curve was released by Pratt & Whitney engineering on 28 March 1969. No compressor instabilities were incurred throughout the extensive flight experience accumulated to date.

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B. Engine Performance Improvement - Unfunded studies by Pratt & Whitney during the third quarter FY-69 have analysed several alternate means of providing varying degrees of improved performance of the J75-P-13B engine. Lockheed will now determine the effect these engine modifications will have on the U-2R aircraft. The studies by Lockheed will be conducted under the DNRO approved FY-69 funding for U-2R engine performance improvement.

## III. PAYLOAD

A. DELTA III Camera Configuration - As a result of an accelerated test program, this configuration demonstrated a system compatibility with the U-2R and was declared Operationally Ready (OR).

B. IRIS II Camera - As of 31 March 1969, four IRIS II cameras have been delivered to the project. During the third quarter FY-69, SN-001 was flown seven times and SN-002 twice. Preliminary results of [REDACTED] indicates SN-001 will be declared OR in early April 1969.

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The air compressor used to furnish air to the air bars of the IRIS II configuration has been shock mounted to the hatch to correct previously experienced operating vibrations in the camera.

C. Thermal Stabilization - In order to insure proper thermal stabilization in the U-2R "Q-Bay" prior to the earliest required camera "ON" time during flight operations, a decision was made to order insulation in the "Q-Bay" hatches and procure preconditioning ground equipment.

25X1

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Approved For Release 2002/08/12 : CIA-RDP83-02415A000800020003-7

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AUTOMATIC DOWNGRADING  
AND DECLASSIFICATION

TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

6409-69  
TAB B, Section 1  
Page 4

25X1

D. Haze Attenuation Study - Further contractual work is being held in abeyance until such time as additional information is received from Eastman Kodak as a result of Red Dot Tests.

Initial polarizer filter tests indicate very little additional information is gained when filters are used to reduce effects of haze, this is particularly true when filters are utilized with panoramic type cameras.

#### IV. LIFE SUPPORT

A. Pinger Assembly - The Pinger currently installed in the U-2C/R aircraft will be replaced with a longer range Pinger in the nose and tail of the aircraft. In addition, the longer range Pinger will be installed on either the pilot seat pack or the pilot's ejection seat.

B. Silver Zinc Battery Life - Results of a test project conducted at Detachment G on the silver zinc battery indicate that these batteries can remain installed until the battery test reveals the open circuit voltage is below 29.1V or when the emergency battery "ON" warning light has illuminated during flight.

C. Liquid Oxygen (LOX) Converter System - The U-2R LOX Converter System is in the final stages of testing and evaluation. It appears at this writing that the system now undergoing tests will provide a longer range and trouble free system.

#### V. U-2R HIGHLIGHTS

A. Aircraft 051 - Lockheed Aircraft Corporation completed the performance of oxygen re-light tests using this aircraft. It is planned to employ the aircraft (two flights) for completion of the auto-pilot tests. Following these, the aircraft will be placed in maintenance and receive [REDACTED] Integrated Display Panel modifications. It will be operationally configured and ready by late May 1969.

25X1

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Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

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AND DECLASSIFICATION

TOP SECRET

25X1

TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

[redacted] 6409-69  
TAB B, Section 1  
Page 5

25X1

25X1 B. Aircraft 053 - This aircraft has [redacted]  
[redacted] Integrated Display Panel modifications.  
It is scheduled for SCOPE SAINT deployment in mid-April 1969.

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25X1 C. Aircraft 054 - This aircraft was earlier identified for  
[redacted] testing and training. It will continue being utilized  
for these purposes.

25X1 D. Aircraft 055 - [redacted] was installed in this aircraft and  
successful results obtained. It has also been the prime test bed for  
sensors (cameras) using the Hycon environmental package.

25X1



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TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

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AUTOMATIC DOWNGRADING  
AND DECLASSIFICATION

25X1

TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

6409-69  
TAB B, Section 1  
Page 6

25X1  
25X1

## VII. GENERAL RESEARCH AND DEVELOPMENT

### A. GENERAL R&D

1. Drag Reduction Program - Results of the wind tunnel test program conducted at the NASA Ames Research Center during the second quarter of FY-69 were analysed and verified the results previously acquired in the Monterey wind tunnel (15% - 20% induced drag reduction). However, discussions with Lockheed Aircraft Corporation (LAC), revealed that the optimum Monterey/Ames Configuration was not structurally compatible with the U-2R. A structurally acceptable redesign was

OX CART/IDEALIST

TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

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AND DECLASSIFICATION

25X1

TOP SECRET

Approved For Release 2002/08/17 : CIA-RDP83-02415A000800020003-7

6409-69

TAB B, Section 1

Page 7

25X1

subsequently tested in the [ ] but the configuration could only provide a 4% - 8% induced drag reduction. Since the practical constraints imposed on this diffuser configuration cause a significant reduction in effectiveness, consideration must be given as to the advisability of continuing this program.

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2. High Altitude Relight Program - The flight test of the high altitude relight system was conducted during the period 20 February 1969 to 24 March 1969 and included a total of 7 test flights in the U-2R aircraft. Three types of hardware changes over the basic J75-P-13B engine configuration were included in the modified test engine. These included sealed burner can crossover tubes, two additional igniters in the combustion chamber and oxygen injection to all four igniters. Tests were conducted utilizing all three engine hardware modifications and various combinations of these modifications, with the following results: Use of the two additional igniters appears to have no effect on relight altitude. Data indicates that the sealed crossover tube modification without oxygen injection would provide a repeatable capability to relight with good acceleration at an altitude of 50,000 feet and a flight Mach number of .75, and that the oxygen injection buys an additional but less repeatable 6000 to 8000 feet. The maximum altitude at which successful relights have been obtained without any of the above relight hardware is 43,000 feet. These were under controlled conditions. Consequently, the U-2R flight manual has indicated that air-starts are possible at altitudes of 43,000 feet, but that above 40,000 feet acceleration will be slow. The sealed crossover tubes therefore have increased the repeatable engine relight altitude in the U-2R from 40,000 feet to 50,000 feet.

25X1

OXCARD/IDEALIST

Approved For Release 2002/08/17 : CIA-RDP83-02415A000800020003-7

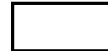
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AND DECLASSIFICATION

25X1

TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP83-02415A000800020003-7



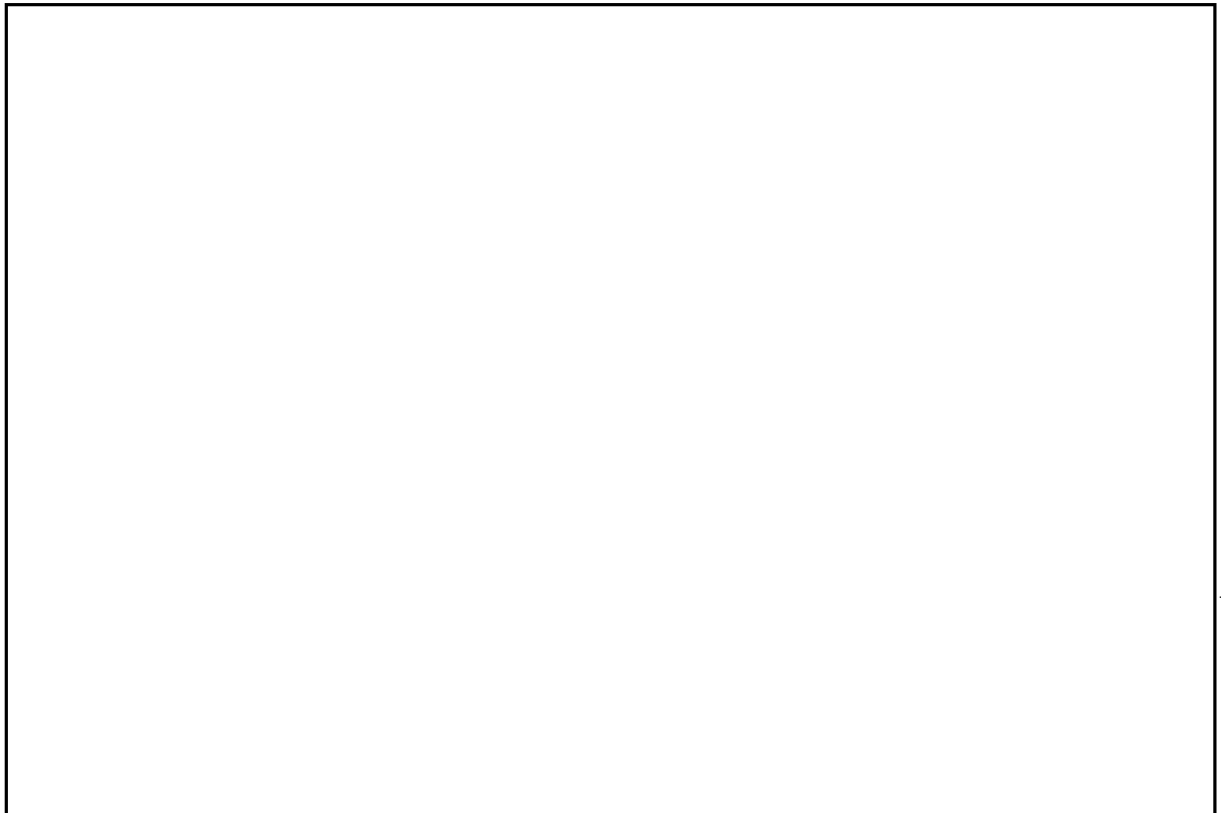
6409-69

TAB B, Section 1

Page 8

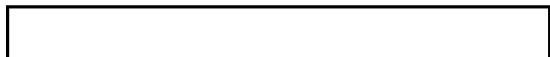
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C. ADVANCED AERODYNAMIC RECONNAISSANCE SYSTEM

A contract was awarded to



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for the investigation of the profiles and tactics element of the overall task. The Office of Scientific Intelligence, DDS&T has supplied the best all source intelligence available on the defensive systems. Significant results should be available for the next progress report.

D. MISCELLANEOUS

Snow Survey Study - At the request of the Environmental Science Services Administration, Department of Commerce, through COMEREX, OSA has been obtaining coverage of the snow cover in the Sierra Nevada range of eastern California. This program, being

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AUTOMATIC DOWNGRADING  
AND DECLASSIFICATION

TOP SECRET



TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP83-02415A000800020003-7

6409-69

25X1

TAB B, Section 1  
Page 9

conducted through the third and fourth quarters of FY-69, is a part of an ESSA evaluation of the capability of photography from an earth Resources Satellite to obtain information for the forecasting of water supply available from snow cover. Small scale (1:280,000) photography is being obtained at monthly intervals in two instrumented regions in the Sierra Nevada mountains. Three successful flights have been made to date; approximately three more are programmed.

25X1

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Approved For Release 2002/08/12 : CIA-RDP83-02415A000800020003-7

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AND DECLASSIFICATION

25X1

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

TOP SECRET

Approved For Release 2002/08/12 : CIA-RDP83-02415A000800020003-7

6409-69

TAB B, Section 2

Page 11

25X1

B. U-2 Special Mission Summary (Headquarters directed non-operational)

1. Mission 0049A was flown by Detachment G Edwards AFB, California (North Base). The purpose of the mission was to simulate an operational mission for Detachment G using the "B" camera in the U-2R. Results were satisfactory.

2. On 7 February, Detachment G was tasked with obtaining photographic coverage of the Union Oil Company drilling disaster off the coast of Santa Barbara, California (Mission 0089A). Using available assets, high resolution color and black-and-white photography was obtained to assist in the determination of the magnitude of the problem. The photography was delivered to the analysts within 48 hours after the initial Department of Interior inquiry. The total affected area was photographed during the single flight.

II. GENERAL

A. SWAP SHOP X and XI - U-2R aircraft [ ] were ferried to [ ] during this reporting period as replacement aircraft for the older U-2C model aircraft. Aircraft [ ] (U-2C) was returned to Lockheed Aircraft Corporation via MAC C-124.

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B. APOLLO IX Support Flights - Three missions were flown in support of APOLLO IX photographic research. Two special configuration [ ] cameras were used. Mission results were satisfactory.

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D. RED DOT: Film Testing - Eight missions completed in support of IDEALIST and other programs, as well as the general intelligence community for determining usefulness of various films and filters under operational conditions.

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AND DECLASSIFICATION

TOP SECRET

OXCART/IDEALIST

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

6409-69

TAB B, Section 2

Page 12

25X1

III. PILOTS AND AIRCRAFT STATUS (As of 31 March 1969)

DETACHMENT "G" (EDWARDS AFB - North Base):

PILOTS



25X1

AIRCRAFT

3 U-2C/G

4 U-2R\*



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AIRCRAFT

2 U-2R\*

\* OPERATIONALLY READY



OPERATIONALLY READY  
(STANDBY STATUS)

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Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

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AUTOMATIC DOWNGRADING  
AND DECLASSIFICATION

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7

25X1

Approved For Release 2002/08/12 : CIA-RDP33-02415A000800020003-7